

Original Article

Investigation of Inflation as a Moderation of the Effect of Monetary Economic Variables on Unemployment in Indonesia

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Abstract: Unemployment is an economic and social problem. Unemployment becomes an economic problem when the unemployment rate increases, and it can be likened to a country that wastes goods and services. Therefore, those who are unemployed can actually produce. Unemployment will become a social problem when there is no income, while consumption must continue; therefore, they try to maintain it, which can cause suffering for the unemployed. If the unemployment problem persists, it will negatively impact economic growth, as the increase in unemployment leads to a decline in economic growth. This study aims to analyze the role of inflation as a moderating variable in the relationship between monetary policy and unemployment rates in Indonesia. Given the complex economic dynamics, this study employs a quantitative approach, utilising secondary data from the Central Bureau of Statistics and Bank Indonesia for the period 2008-2023. The analysis model used is path analysis to identify how inflation moderates the influence of monetary variables, such as interest rates, exchange rates, and money supply, on the unemployment rate. The results of the study show that inflation fails as a moderating variable, so that the impact of monetary policy on unemployment is direct. At low inflation rates, a significant negative relationship exists between monetary policy and unemployment; however, this relationship becomes weaker at high inflation rates. These findings provide important insights for policymakers in designing more effective economic policies, taking into account existing inflation conditions. This study also suggests the need for a comprehensive strategy to overcome unemployment, which does not only focus on monetary policy but also considers inflation factors as the main driver.

Keywords: Inflation, Monetary Variables, Unemployment, Moderation, Phillips Curve.

I. INTRODUCTION

Since the unemployment rate has the potential to undermine national stability in any nation, it is an issue for all of them. (Hasibuan, Safira, & Jannah, 2022). Unemployment is one of the economic problems that often occurs in Indonesia. The graph below shows the development of the unemployment rate in Indonesia from 2008 to 2023.

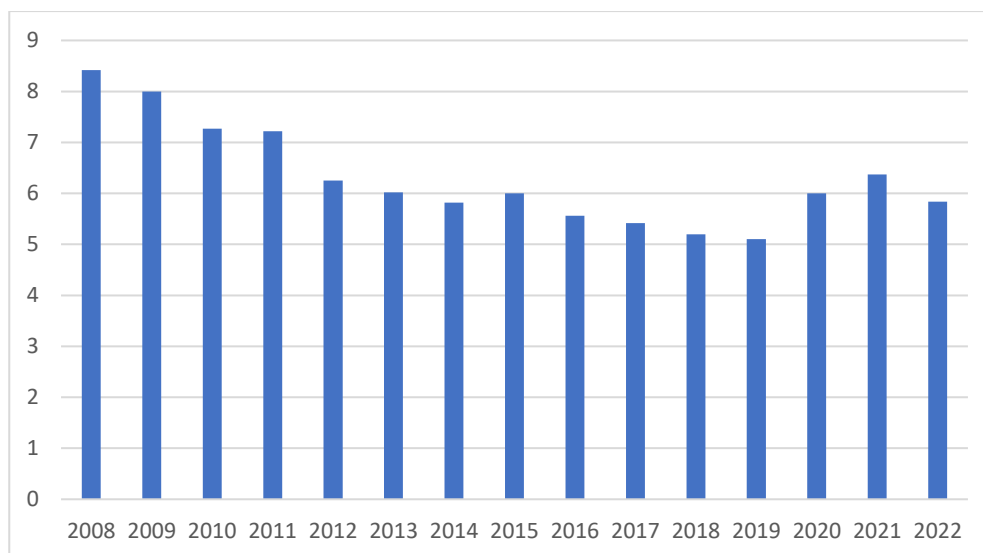


Fig. 1 Development of Unemployment in Indonesia (%)

Source: Central Statistics Agency, 2024



Based on data published by the Central Statistics Agency. The graph above shows that the unemployment rate in Indonesia changes every year. Where the unemployment rate in Indonesia decreased from 2008 to 2012 and fluctuated at a reasonable level until 2022, the unemployment rate in 2009 decreased compared to 2008 by 8.42% to 8.00%. Continued in the following year, 2010, by 7.27% and the following year, the unemployment rate decreased significantly from 2012 to 2022, which touched 5 to 6 percent.

Unemployment is a problem that has a negative impact on a country's economy. High unemployment has a major impact on the economy. The higher the number of unemployed, the lower people's income will be, where the decrease in income triggers various socio-economic problems in life (Faisal & Bakar, 2022).

In the context of a country's macro and micro economy, the stability of its economy is considered effective. The stability of a country's economy is measured by macroeconomic indicators, including price stability. Inflation is a monetary phenomenon that causes economic instability as it rises and falls (Simanungkalit, 2020). The inflation rate is a macroeconomic indicator that can describe the condition of the national economy. A high inflation rate can be interpreted as a condition where demand for products exceeds the capacity of production supply, so that the price of goods tends to increase. High inflation can also reduce people's purchasing power and reduce Indonesia's economic growth (Christianingrum & Syafri, 2019). The following is a graph showing the development of the inflation rate in Indonesia from 2008 to 2023.

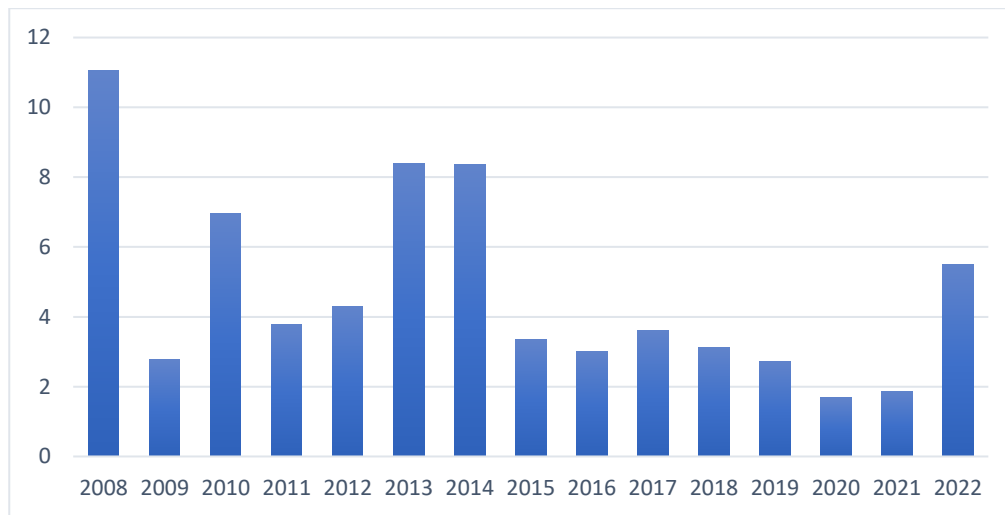


Fig. 2 Development of Inflation in Indonesia (%)

Source: Central Bank of Indonesia, 2024

The highest inflation in Indonesia occurred in 2008, reaching 11.06%. The increase in inflation in 2008 was primarily due to the rise in domestic fuel prices and the conversion of kerosene to LPG, which contributed significantly to inflation that year. The lowest inflation rate in Indonesia reached 1.68%-1.87% in 2020 and 2021. However, 2012 to 2014 showed a significant increase, and continued with the inflation rate, which tended to fluctuate from 2015 to 2021, showing a downward trend from year to year. Inflation increased again in 2022 by 5.51% due to increasing public demand with the improving pandemic conditions. Inflation is a problem that continues to receive government attention. When the inflation rate increases suddenly due to certain conditions beyond government expectations, such as the effects of unemployment rates, a very large depreciation of the value of money, and instability of natural conditions, it can also affect the rise and fall of inflation. In dealing with the problem of inflation, the government will formulate steps aimed at achieving price stability again (Sukirno, 2015).

High inflation will cause real income in the community to continue to fall, creating uncertainty for economic actors. Bank Indonesia can affect inflation via monetary policy, with the primary aim of maintaining price stability dictated by the objectives established in the Central Bank Law of the nation. The primary objective of monetary policy in Indonesia, as articulated in Article 7 paragraph (1) of Law Number 3 of 2004, is to attain and sustain the stability of the rupiah (Bank Indonesia, 2022). Meanwhile, Indonesia's exchange rate regime is a managed floating exchange rate system, which means that the rupiah exchange rate is formed and fully submitted to market mechanisms based on the laws of supply and demand, with some controls. Furthermore, inflation can be influenced by the rupiah exchange rate; namely, if the exchange rate continues to weaken, it will eventually have an impact on the balance of the Indonesian economy. With the increase in the dollar, the price of imported goods has increased in the domestic market, so this can reduce people's purchasing power, which will ultimately trigger inflation (Amrini, Aimon, & Syofyan, 2012).

To reduce the weakening of the Indonesian rupiah (IDR) exchange rate against the US Dollar, which has an impact on increasing inflation, the Central Bank of Indonesia has raised its benchmark interest rate, namely the BI rate (Anas, 2006). The interest rate was raised with the aim of being able to reduce the amount of money circulating in the community so that people want to save IDR in the form of deposits, and SBI--is a certificate of the Indonesian central bank, namely a security issued by the Indonesian central bank--(Maski, 2007). The Central of Bank Indonesia, as the monetary authority, makes efforts to stabilize the economy through the SBI interest rate, where the determination of SBI is carried out to control the amount of money in circulation, because when the amount of money circulating in the community is too much, it will cause inflation. An excessive increase in the amount of money in circulation can encourage prices to increase beyond the expected level, so that in the long term, it can disrupt economic growth activities (Anas, 2006). The increase in inflation will also result in an increase in production costs. Rising production costs, but not balanced by increasing income, will make business activities in several companies unstable, some of which will even stop operating, resulting in layoffs, which will result in increased unemployment. (Susandika, 2023).

Indonesia's economic conditions contracted by around 2%, from 6.01% in 2008 to 4.63% in 2009. This was due to the global economic crisis caused by subprime mortgages, which not only destroyed the financial sector but also significantly impacted Indonesia's domestic real sector. Meanwhile, the inflation rate decreased from 11.06% in 2008 to 2.78% in 2009, and Bank Indonesia lowered the benchmark interest rate from 8.42% to 8.00% in the same year. With the decrease in interest rates, domestic spending increased, encouraging the real sector to stabilise the economy in Indonesia (Bank Indonesia, 2009). The Indonesian economy has improved from year to year. However, in 2019, the COVID-19 outbreak occurred, and the spread of this virus has affected various countries, including Indonesia, with an impact on the economy. In 2020, the Indonesian economy experienced a decline of minus 2.07%. One of the causes is that many companies are laying off employees, and it is reported that around 1.5 million employees have been laid off or are unemployed. On the other hand, the inflation rate is 1.68%, which tends to fluctuate in order to maintain economic stability.

In line with that, Bank Indonesia sets the benchmark interest rate together with the determination of the Inflation Targeting Framework. The benchmark interest rate is set so that it can influence market interest rates, deposit interest rates and bank credit interest rates. Economic turmoil can also affect inflation and output, resulting in a worsening economy resulting and layoffs, which will result in layoffs, and an increase in the unemployment rate. The following is a description of the development of the unemployment rate and inflation rate.

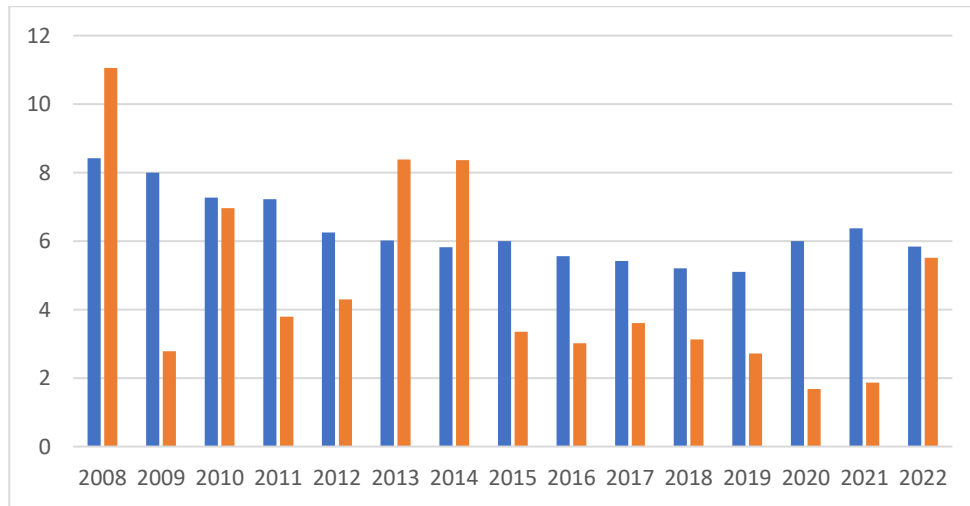


Fig. 3 Development of Unemployment and Inflation (%)

Source: Central Bank of Indonesia and Central Bureau of Statistics, 2024

In the graph above, inflation in Indonesia from 2009 to 2010 increased from 2.78% to 6.96%, and this was also accompanied by a decrease in the unemployment rate from 8.00% to 7.27%. The inflation target is the inflation rate that must be achieved by Bank Indonesia. It can be seen that in 2008 inflation increased due to the global crisis that occurred in America and Europe, followed by 2009, which was still affected by the global crisis, the increase in unemployment reached 8%. In 2011 to 2012, there was a very good inflation rate below the 5% inflation target, namely 3.79% and 4.30%. While the inflation rate in 2013 and 2014 reached 8.38% and 8.36% respectively, this inflation increased due to the government's policy of announcing an increase in the price of fuel oil and several other commodities. In 2015 was recorded at 3.35% lower to 2014 due to policies from Bank Indonesia and the Government. The achievement of a stable inflation rate in the following year was also supported

by the unemployment rate, which experienced a decline, tending to be stable. (Bank Indonesia, 2014). The inflation rate and unemployment rate tend to fluctuate. This makes the government use monetary instruments to control inflation. Monetary instruments can indirectly affect the target to control inflation and indirectly help stabilise unemployment rates. Based on the background, the formulation of the problem in this study is as follows:

1. Is there a direct influence between interest rates, money supply, exchange rates and inflation on unemployment in Indonesia?
2. Is there a direct and indirect influence between interest rates, money supply and exchange rates on unemployment--through inflation--in Indonesia?

II. LITERATURE REVIEW

Unemployment is one of the problems in the employment sector, and this is a serious problem for a country's economy, because it is directly related to people's income. The unemployed are those who do not have jobs and are not actively looking for work. The category of unemployed people is usually those who do not have jobs at working age (Purnamawati & Yuniarta, 2021). The unemployed are those who are looking for work and who are preparing a business, and those who are not looking for work even though they are of working age (Mankiw, 2018). Unemployment is also influenced by many factors such as technological advances, inadequate education and training and unequal distribution of job opportunities. These factors play an important role in the high unemployment rates that occur in several countries. To mitigate this problem, it is important for the government to create policies that prioritize new jobs, education and training (Triatmanto & Bawono, 2023).

According to the Central Bureau of Statistics (2004), the concepts and definitions used in collecting employment data include: (a) those who are looking for work; (b) those who are preparing a business; and (c) those who are not looking for work. The definition of looking for work is where the activities of a person who is not working and at the time the survey is conducted, the person is looking for work, where among them are people: (a) who have never worked and are trying to get a job; (b) who have worked, for some reason so they stop or are dismissed and are trying to get a job (Central Bureau of Statistics, 2004). Furthermore, the Central Bureau of Statistics (2004) states that the unemployment rate is a measure that shows how many of the workforce are currently active to determine the unemployment rate. Measuring the unemployment rate is the task of the Central Bureau of Statistics by collecting unemployment data and other aspects of the workforce, such as type of work, average working hours and type of unemployment, so that it can be calculated using the following formula:

$$\text{Unemployment Rate} = (\text{Total Number of Unemployed}) / (\text{Number of Workforce}) \times 100$$

A) Inflation

Inflation refers to the general and ongoing rise in the costs of goods and services, quantified as a percentage increase in the prices of various items typically consumed by households (Natsir, 2014). Referring to this definition, there are three conditions for inflation to occur. First, there is a price increase. Second, the increase occurs in the prices of goods in general. Third, the increase lasts quite a long time. If the price increase that occurs is only for one type of goods, or the increase that occurs is only temporary, then this condition cannot be called inflation (Purnamawati & Yuniarta, 2021).

In line with the previous explanation, to be able to describe how inflation occurs, there are three groups of theories related to inflation, namely Quantity Theory, Keynesian Theory and Structuralist Theory. Of these three theories, the one that focuses on discussing non-monetary aspects is structuralist theory. While the two theories focus more on the monetary aspect. For example, the quantity theory discusses more about the causes of inflation in modern times, especially in developing countries (Mardiana, 2015)

B) Quantity Theory

Quantity theory is a hypothesis regarding the factors that cause changes in the inflation rate, when an increase in the money supply is one of the factors that influences the increase in price levels. Gabriel (2023) refined the quantity theory by compiling a theory of the demand for money, where the theory of the demand for money is the public's demand for money, which is determined by a number of economic variables such as economic growth, interest rates and price levels. Changes in the inflation rate occur if the amount of money in circulation does not match the amount of money demanded or needed by the public, so that prices increase and inflation occurs. Likewise, vice versa, if the amount of money in circulation is less than the amount of money needed by the public, there will be a decrease in the price level and deflation (Paramita, 2021). Keynes' theory explains that inflation occurs because people want to live beyond their economic capabilities. Consequently, the public demand for commodities surpasses the available supply. In addition, the increase in money in circulation can have an impact on real variables such as output and interest rates.

C) Structuralist Theory

This theory is also called the long-term inflation theory, because it discusses the causes of inflation originating from the economic structure, especially in developing countries. According to this theory, there are two structural problems in the

economy of developing countries that can cause inflation, namely, inelastic export revenues where export growth is slow due to the growth of other sectors and structural problems of the economy of other developing countries (Paramita, 2021).

D) The Relationship Between Inflation and Unemployment - Phillips Curve

In 1958, economist AW Phillips showed a negative correlation between the unemployment rate and the inflation rate. The Phillips curve is a short-term relationship between inflation and unemployment. From the results of his study, he obtained a negative relationship between the percentage increase in wages and unemployment. So Phillips concluded that two important variables in macroeconomics, inflation and unemployment, are related to each other (Mankiw, 2018).

The relationship between inflation and unemployment can be seen from the analysis of the curve that shows a negative relationship often referred to as the Philips curve, the Philips curve explains two things that cannot happen simultaneously such as high employment opportunities must be willing to bear the burden of inflation, so both cannot happen simultaneously and there must be a "trade of" between inflation and unemployment in the short term. For example, if the policy taken to suppress the rate of inflation, there will be a tendency for unemployment to be high and vice versa. If the unemployment rate is low, the inflation rate will be high. (Mankiw, 2018).

A.W. Phillips elucidates the inverse relationship between inflation and unemployment, attributing inflation to an escalation in aggregate demand. According to demand theory, a boost in aggregate demand will result in a corresponding rise in prices for goods or services. To meet this demand, producers will increase their production capacity by adding workers (because adding workers is the only way to increase output). With the increase in the workforce, unemployment is reduced and accompanied by high inflation (Astuti, 2016)

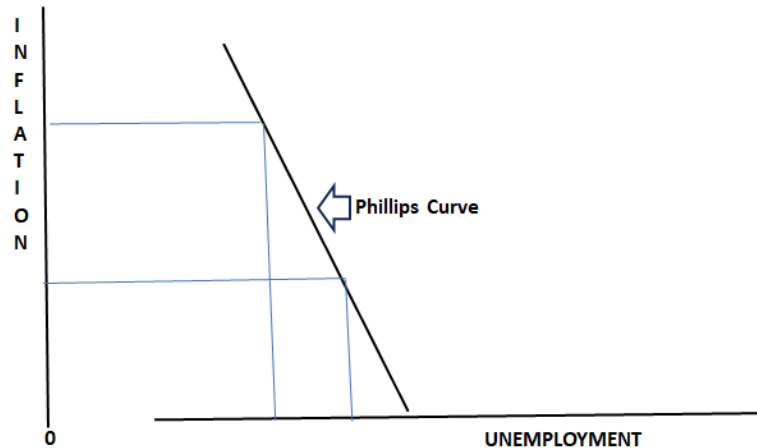


Fig. 4 Phillips Curve

Source: Mankiw, 2018

Referring to Figure 4, it appears that the curve shows a short-term trade-off between the unemployment rate and the inflation rate. Point A offers high unemployment and low inflation. For example, if you want to achieve a low inflation rate of 2%, you must accept a high unemployment rate of 7%. Likewise, point B offers a low unemployment rate and high inflation; for example, if the unemployment rate is 4%, you must pay with a high inflation rate of 6%.

The relationship between unemployment and inflation is actually influenced by various factors, including factors from monetary and economic variables. In this case, monetary policy can affect the inflation rate. However, for unemployment, the role of monetary economics is very small because it is more influenced by other macro variables. Therefore, it can be concluded that unemployment can be affected by inflation, but inflation is affected by monetary economic policy. When monetary policy has been set optimally and there are no shocks from the economy, the central bank will target inflation and will neutralize aggregate demand to achieve constant inflation according to its target. This can cause a negative correlation between inflation and economic downturn (Gabriel, 2023). The following explains the relationship between monetary variables, inflation, and unemployment.

E) Relationship between Interest Rates, Inflation and Unemployment

Monetary policy is one of the factors to reduce unemployment. The influence of monetary policy on unemployment, in theory, is that when there is an increase in interest rates or a decrease in the money supply, resulting in a slowdown in economic growth, this will ultimately increase the unemployment rate. Interest rates play a role in reducing the unemployment rate. When the central bank implements an expansionary monetary policy (lowers interest rates), it will affect the real sector because credit

interest rates will fall and investors will expand investment so as to reduce unemployment. (Susandika, 2023). The interest rate is the annual interest payment on a loan expressed as a percentage of the loan amount, calculated by dividing the annual interest received by the total amount of the loan. The interest rate is the monetary compensation per unit of time. It can be interpreted that people have to pay a fee to borrow (Nopirin, 1990). The interest rate functions as a mechanism for the allocation of production elements to generate commodities and services for current and future usage. Two elements determine the value of the interest rate: internal and external forces. Internal factors encompass national income, money supply, and inflation. External variables include foreign interest rates and the fluctuations in foreign exchange rates (Herlina & Wirdianingsih, 2023).

The Gibson Paradox theory explains that there is a tendency for prices and interest rates to move together. If the price level increases, interest rates will also tend to increase. Conversely, if the price level decreases, interest rates will also tend to decrease. When price changes are anticipated, it means that people immediately anticipate what will happen. So that high interest rates will be associated with rapid inflation rates (Firdaus, 2022). Fisher formed an equation for the relationship between nominal and real interest rates with inflation, as explained in the following equation:

$$i = r + \pi \text{ or } r = i - \pi$$

where,

r = real interest rate

i = nominal interest rate

π = inflation

The equation above explains that the nominal interest rate is influenced by the real interest rate and inflation. When inflation rises, the nominal interest rate paid by the bank will also rise. In addition, the nominal interest rate can also be influenced by the real interest rate; this will also increase the nominal interest rate. In the Fisher equation, a relationship can be formed between interest rates and inflation, which is often called the Fisher effect. Fisher stated that a 1 percent increase or decrease in the inflation rate will cause a 1 percent increase or decrease in the nominal interest rate. Apart from the theory put forward by Fisher, interest rates can also be used as an instrument to suppress the inflation rate. When interest rates are high, the price of holding money will also be high. And when interest rates increase, people will tend to choose to save it in the bank rather than invest in the real sector. This can also reduce the amount of money circulating in the community, so that inflation can also be overcome (Anas, 2006).

Inflation is one indicator of a country's worsening economy. High inflation rates encourage central banks to raise interest rates, and what can happen is an increase in unemployment, so that the inflation rate and unemployment rate can be used to measure the good or bad economy of a country (Yehosua, Rotinsulu, & Niode, 2019).

F) Relationship between Exchange Rates, Inflation and Unemployment

To facilitate the discussion of the exchange rate or currency rate of a country, several assumptions are needed as follows (Natsir, 2014): First, each country issues its own currency. For example, the United States (US) has and uses a currency called the US dollar, Brazil (real), Indonesia (rupiah), etc. Second, countries whose currency values are involved in international trade or transactions. Third, in the analysis, consider or involve two countries. For example, between the exchange rate of the United States and Indonesia, the nominal amount of Indonesian money (rupiah) is measured in US dollars.

The exchange rate denotes the value of a local currency in relation to a foreign currency, specifically representing the worth of one rupiah when converted into another nation's currency. For instance, the exchange rate of the rupiah relative to the US Dollar, among others. The exchange rate is a determinant that influences stock market activity, as investors typically exercise caution in their investing decisions. The depreciation of the rupiah versus foreign currencies, particularly the US Dollar, adversely affects the economy (Perlambang, 2012). The theory of exchange rates is elucidated by the Mundell-Fleming model, which serves as an open economy adaptation of the IS-LM model. This model highlights the interplay between the money market and the product market, positing a fixed price level and illustrating short-term economic swings. The exchange rate influences the economy when it appreciates or depreciates. An increase in the exchange rate is termed depreciation of the domestic currency, resulting in the foreign currency becoming more costly, indicating a decline in the value of the home currency. A decline in the exchange rate is termed depreciation of the domestic currency, indicating that the foreign currency is becoming more expensive, hence signifying a decrease in the value of the domestic currency. Factors that influence the exchange rate include the rate of inflation, income level and interest rates (Kurniawan, 2013).

In addition, exchange rate depreciation will increase company costs, and if this is not offset by increased income, it will result in losses for the company. The company will try to reduce production costs by reducing employee wages; it is even possible that there will be a reduction in employees, resulting in termination of employment and increased unemployment (Burhani, 2014)

G) Relationship between Money Supply, Inflation and Unemployment

Monetary authorities and commercial banks are institutions that can create money. The central bank issues and circulates paper money while commercial banks issue and circulate demand deposits and quasi-money. Both of these institutions are included in the monetary system because both of these institutions have a monetary function, namely creating money (Natsir, 2014). The amount of money in circulation is not only determined by the policy of the central bank, but also by households and banks. It can be remembered by remembering that the amount of money in circulation includes foreign currency in the hands of the public and deposits in banks that can be used by households for transactions such as bank accounts. According to Keynes, inflation is also caused by aggregate demand, not only because of central bank expansion, but can also be caused by investment spending by both the government and the private sector (Perlambang, 2012).

The value of currency is dictated by its supply and demand, while the Central Bank regulates the money supply in circulation. The demand for money is influenced by various factors, including the average price level within the economy. The public's desire for money to conduct transactions is contingent upon the prevailing price level of products and services. An increase in the price level results in a stronger demand for money (Anas, 2006). The price escalation will subsequently elevate the public's monetary demand. The quantity theory of money elucidates the determination and fluctuations of the price level in relation to the money supply in circulation. The quantity of money in circulation within an economy dictates the value of currency. The increase in the money supply is the primary driver of inflation. This quantity theory of money elucidates the impact of the money supply on the economy, correlating it with price and output variables. This relationship can be written in the following equation:

$$M V = P Y$$

Where,

P = price

Y = output

M = money supply

V = velocity of money

This equation is called the quantity equation, and in the formula, it can be explained that the price level is determined by the comparison between the flow of money (MV) and the flow of goods or the amount of output (Y). If M increases twofold while Y and V remain constant, then the amount of output goods with the amount of money will increase twofold, which means that the average price level will increase twofold (Burhani, 2014). The amount of money in circulation must also be balanced with the availability of goods and services. If there is an increase in the amount of money in circulation, but is not balanced with the readiness of producers in providing goods/services, then inflation is possible, inflation that is not balanced with good economic conditions in society, in terms of income levels, will cause people's purchasing power to decrease which will also result in a decrease in producer income. To avoid losses, producers will tend to reduce costs by reducing the workforce they have. This will certainly result in layoffs, so that unemployment rates increase (Burhani, 2014).

H) Relationship between Interest Rates, Money Supply and Exchange Rates to Inflation

Changes in interest rates will affect several macroeconomic variables, including inflation. Interest rate control functions to maintain economic conditions so that they can run in a balanced manner. One way to control inflation is by raising Bank Indonesia's interest rates. An increase in bank interest rates will make people save their funds in banks. However, when interest rates decrease, people will withdraw their funds and will consume, so that the amount of money in circulation will increase and cause commodity prices to increase (Rasyidin, Saleh, Muttaqim, Nova, & Khairani, 2022).

An increase in the amount of money in circulation can increase demand for a commodity, which will cause an increase in the price of goods (inflation). An excessive increase in the amount of money in circulation will cause hyperinflation. Therefore, it is very important to control the amount of money in circulation in the community so that it can have a positive effect on economic variables in the real sector, such as inflation, investment and production.

The rise in inflation will coincide with a depreciating currency rate. The depreciation of the rupiah relative to the dollar may be attributed to various causes, including global economic conditions, inflation, and interest rates. The relationship between inflation and exchange rates cannot be considered normal. When the currency appreciates, the price of imported goods becomes relatively cheaper. This will have an impact on people's purchasing power. In the long term, the high demand will trigger inflation. So a policy is needed to guarantee goods and services while maintaining stability in terms of both supply and demand (Faidzin, 2020).

I) The Relationship between Inflation and Unemployment

The relationship between inflation and unemployment can be seen from the analysis of the curve which shows a negative relationship often referred to as the Philips curve, the Philips curve explains two things that cannot happen

simultaneously such as high employment opportunities must be willing to bear the burden of inflation, so both cannot happen simultaneously and there must be a "trade of" between inflation and unemployment in the short term. For example, if the policy taken to suppress the rate of inflation, there will be a tendency for unemployment to be high and vice versa. If the unemployment rate is low, the inflation rate will be high. (Mankiw, 2018).

Referring to the previous theoretical description, a research framework can be drawn up, as can be seen in the image below. The figure below explains the relationship between research variables, where the inflation variable acts as a moderating variable for the influence of monetary economic variables on unemployment.

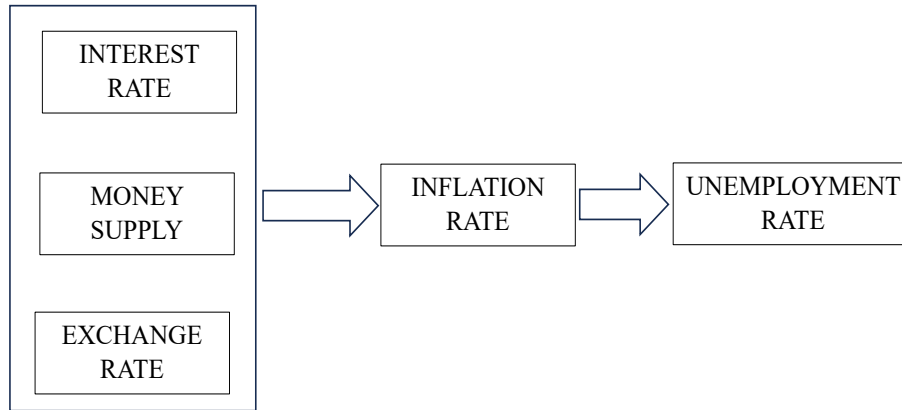


Fig. 5 Research Framework

J) Research Hypothesis

- Hypothesis 1: Interest rates, Money supply, exchange rates, and inflation have a direct effect on unemployment
- Hypothesis 2: Interest rates, Money supply, exchange rates, and inflation have an indirect effect on unemployment
- Hypothesis 3: Inflation mediates the effect of Interest rates, Money supply, and exchange rates on unemployment

To answer the problem formulation and research hypothesis, the following research method was prepared. This research method is quantitative, and the quantitative approach is an approach based on the philosophy of positivism to test the implementation of research on the relationship between variables using numbers as the result of a measurement (Sugiyono, 2011). The variety of data used is secondary data obtained from various sources, namely Bank Indonesia and the Indonesian Central Statistics Agency. The data used is quarterly data, and the period used starts from 2008:1 to 2023:4. Furthermore, the research variables include interest rates, Money Supply, Rupiah exchange rate, inflation, and unemployment.

Referring to the research framework, this research model is a path analysis. This model is used to determine the relationship between exogenous and endogenous variables, and to prove that inflation moderates the influence between variables, as in the research framework above.

In path analysis, a path diagram is made to help determine the nature or relationship of the right causal structure (Sanusi, 2011). The path diagram shows the causal relationship of exogenous variables (causes) to endogenous variables (effects). Based on the path diagram that has been prepared, the following structural equation is obtained:

$$\begin{aligned}
 P &= \alpha + \rho_1 IR + \rho_2 MS + \rho_3 ER + \varepsilon_1 \dots\dots\dots 1 \\
 UE &= \alpha + \rho_1 IR + \rho_2 MS + \rho_3 ER + \rho_4 P + \varepsilon_2 \dots\dots\dots 2
 \end{aligned}$$

Where,

- P = inflation rate
- UE = unemployment rate
- IR = interest rate
- MS = money supply
- ER = exchange rate

The structural equation that has been compiled will then be estimated using regression to test the hypothesis through statistical tests (t-test, F-test, R^2). Meanwhile, for testing the mediation variable, the Sobel test is used. The Sobel test in this study is used to determine the significance of the indirect influence path coefficient of the independent variable on the dependent variable through the mediation variable. The results of the Sobel test can be seen through the calculation of the t-statistic value with the following formula (Ghozali, 2011).

$$t = \frac{ab}{\sqrt{b^2Sa^2 + a^2Sb^2 + Sa^2Sb^2}}$$

Description:

- ab : Indirect influence coefficient, which is the result of multiplying the coefficient of direct influence (a x b)
a : Coefficient of direct influence of the independent variable on the mediation variable
b : Coefficient of direct influence of mediation variable on dependent variable
Sa : Standard error of the influence of the independent variable on the mediation variable
Sb : Standard error of the influence of the mediation variable on the dependent variable

III. RESULT AND DISCUSSION

A) Analysis Model Estimation Results

The estimation results of equations 1 and 2 above aim to determine the influence of independent variables (interest rate, exchange rate, money supply) on the dependent variable (inflation), then equation 2 is the influence of independent variables (interest rate, exchange rate, money supply, and inflation) on the dependent variable (unemployment).

Table 1: Estimation Result of Path Model

Variables	Equation 1	Equation 2
	Coeffisien	Coeffisien
Constant	-103.918 [-0.350]	9.936885 [7.048]
Interest Rate (IR)	1.167 [4.562]	0.138775 [2.765]
Exchange Rate (ER)	-6.334E-5 [-0.373]	-0.000277 [-2.316]
Money Supply (MS)	-4.187E-7 [-0.917]	-2.77E-08 [-0.055]
Inflation Rate (P)		-0.123394 [-2.367]
Unemployment Rate (UE)	-	

Description:

- Equation 1 : dependence variable is inflation
Equation 2 : dependence variable is unemployment
[] : t-statistics value

Decision making in this test is done by looking at the magnitude of the t-statistic value, and the following is the equation of equation 2 from the results of the regression estimation so that the following equation is obtained:

$$UE = 9.936885 + 0.138775 IR + -0.000277 ER + -2.774780 MS + -0.123394 P + \epsilon$$

Based on this equation, it can show the meaning of each variable as follows:

- The interest rate variable shows a coefficient value of 0.138775 and has a t-statistic value of 2.765, and this means that the interest rate variable has a significant positive effect on unemployment.
- The exchange rate variable shows a coefficient value of -0.000277 and has a t-statistic value of -2.316, and this means that the exchange rate variable has a significant negative effect on unemployment.
- The variable of money supply shows a coefficient value of -2.77E-8 and has a t-statistic value of -0.055, and this means that the variable of money supply has no effect on unemployment.
- The inflation variable shows a coefficient value of -0.123394 and has a t-statistic value of -2.367, and this means that the inflation variable has a significant positive effect on unemployment.

B) The Sobel Test

a. Test of the Indirect Effect of Interest Rates on Unemployment Through Inflation

a	1.254655	a²	1.574159
b	-0.123394	b²	0.015226
Sa	0.29952	Sa²	0.089712
Sb	0.089712	Sb²	0.008147
ab	0.154816		

$$\begin{aligned}
 Sab &= \sqrt{b^2Sa^2 + a^2Sb^2 + Sa^2Sb^2} \\
 Sab &= \sqrt{0.001365 + 0.012825 + 0.000730} \\
 Sab &= \sqrt{0.0149219} \\
 Sab &= 0.122155 \\
 T_{hit} &= \frac{a \times b}{Sab} \\
 &= \frac{0.154816}{0.122155} \\
 &= 1.26737813 \\
 T_{hitung} &= 1.267378 \\
 T_{tabel} &= 2.051830
 \end{aligned}$$

The results of the Sobel test show that the t-count value is smaller than the t-table value, meaning that the indirect effect of interest rates on unemployment is not significant. In other words, inflation fails to mediate the effect of interest rates on unemployment.

b. Test of the Indirect Effect of Exchange Rates on Unemployment Through Inflation

a	0.000233	a²	5.4289e-08
b	-0.123394	b²	0.01522608
Sa	0.000246	Sa²	6.0516e-08
Sb	0.090262	Sb²	0.00814723
ab	-2.87508e-05		

$$\begin{aligned}
 Sab &= \sqrt{b^2Sa^2 + a^2Sb^2 + Sa^2Sb^2} \\
 Sab &= \sqrt{9.214211 + 4.42305e - 10 + 4.03038e - 10} \\
 Sab &= \sqrt{1.85676E - 09} \\
 Sab &= 4.30902e - 05 \\
 T_{hit} &= \frac{a \times b}{Sab} \\
 &= \frac{2.87508e - 05}{4.30902e - 05} \\
 &= 0.667223925 \\
 T_{hitung} &= 0.667223 \\
 T_{tabel} &= 2.051830
 \end{aligned}$$

In the calculation results of the Sobel test above, the t-count is 0.667223, which is smaller than the t-table of 2.051830. From the calculation results, it can be concluded that the inflation variable is unable to mediate the effect of the exchange rate on unemployment.

c. Test of the Indirect Effect of the Amount of Money Supply on Unemployment through Inflation

The results of the Sobel test calculation above obtained a t-count of 0.21482, smaller than the t-table of 2.051830. From the results of these calculations, it can be concluded that the inflation variable is unable to mediate the effect of the amount of money in circulation on unemployment.

C) Discussion

a. Analysis of the Direct and Indirect Effects of Interest Rate Variables on Unemployment through Inflation

The interest rate variable has a probability value of 0.0453, smaller than the 5% significance level. This means that the interest rate variable has a significant effect on unemployment. The regression coefficient value is 0.138775, which means that there is a positive relationship between the interest rate variable and unemployment. So if the interest rate increases by 1%, the average unemployment rate will increase by 0.138775%. The first hypothesis, which assumes that interest rates have a direct effect on unemployment, is accepted.

This study is in line with research conducted by Khairunnisa (2022), whose research results explain that interest rates have a positive relationship and have a significant effect on the unemployment rate. When interest rates increase by 1%, the unemployment rate will also increase. This shows that this study is in line with the general theory that when interest rates decrease, the unemployment rate will also decrease, and when interest rates increase, the unemployment rate will also increase. When the interest rate set by the Central Bank in Indonesia increases, people in the area will consider making

transactions at the bank. So many people cannot open a business due to a lack of capital and business costs, which will later trigger a large increase in the unemployment rate in the community.

Likewise, if the government sets low interest rates, people will make transactions with banks to find capital to run a business, so that unemployment will decrease (Khairunnisa, 2022). Based on the results of this study, it can be said that the interest rate is one of the factors that can affect unemployment in Indonesia. The findings of this study are also the same as those obtained by Yehosua, Rotinsulu, & Niode (2019) and Susandika, Unemployment in Indonesia: Empirical Investigation (2023) where the interest rate has a positive and significant effect on unemployment.

It is known that the results of the Sobel test calculation above obtained a t-count of 1.267378, which is smaller than the t-table (N: 32) of 2.051830 at a significance level of 5%. So it can be concluded that the mediation coefficient is not significant, which means that inflation is not able to mediate the indirect effect of interest rates on unemployment. The hypothesis that assumes that inflation mediates the effect of interest rates on the unemployment rate is rejected. The findings obtained using the Sobel Test indicate that the inflation variable cannot mediate the relationship between interest rates and unemployment. The results of the study were different from the proposed hypothesis. The test results show that the interest rate variable is able to have a direct effect on unemployment. However, it cannot affect unemployment indirectly through inflation. The results of the study indicate that there is a problem with inflation, which partially has a negative effect, meaning that the higher the inflation rate, the lower the unemployment rate.

b. Analysis of the Direct and Indirect Effects of Exchange Rate Variables on Unemployment through Inflation

The exchange rate variable has a profitability value of 0.0284, which is smaller than the 5% significance level. This means that the exchange rate variable has a significant effect on unemployment. The regression coefficient value is -0.000277, which means that there is a negative relationship between the exchange rate variable and unemployment. So if the exchange rate increases by 1%, on average, the unemployment rate will decrease by 0.000277%. The first hypothesis, which assumes that the exchange rate has a direct effect on unemployment, is accepted.

Based on the data above, this study is also in line with research conducted by Susandika (2023), whose research results explain that the exchange rate has a negative relationship and has a significant effect on the unemployment rate in the short term. The exchange rate significantly influences the unemployment rate, exhibiting a negative or inverse correlation. An increase in the exchange rate relative to the rupiah will decrease the unemployment rate in Indonesia; conversely, a reduction in the rupiah exchange rate will result in an increase in unemployment in Indonesia.

It can be assumed that when the exchange rate increases, it will have an impact on increasing company costs, and if this is not balanced with increased income, it will cause losses for the company. The company will try to reduce production costs by reducing employee wages, even possibly reducing employees so that layoffs occur which resulting in increased unemployment. Based on the results of this study, it can be said that the exchange rate is one of the factors that can affect unemployment in Indonesia. The findings of this study are also the same as those obtained by Burhani (2014) and Anas (2006), where the interest rate has a negative and significant effect on unemployment. It is known that the results of the Sobel test calculation above obtained a t-count of 0.667223, which is smaller than the t-table (N: 32) of 2.051830. So it can be concluded that the mediation coefficient is not significant, which means that inflation is unable to mediate the indirect effect of the exchange rate on unemployment. The hypothesis that inflation mediates the effect of the exchange rate on the unemployment rate is rejected.

The findings obtained using the Sobel Test in this study indicate that the inflation variable cannot mediate the relationship between the exchange rate and unemployment. The results of the study were different from the proposed hypothesis. The test results show that the exchange rate variable is able to have a direct effect on unemployment. However, it cannot affect unemployment indirectly through inflation. The results of the study indicate that there is a problem with inflation, which partially has a negative effect, meaning that the higher the inflation rate, the lower the unemployment rate. However, the exchange rate itself can significantly affect the inflation variable directly.

c. Analysis of the Direct and Indirect Effects of the Money Supply Variable on Unemployment through Inflation

The money supply variable has a profitability value of 0.9562, which is greater than the 5% significance level. This means that the money supply variable does not have a significant effect on unemployment. The regression coefficient value is -2.77E-08, which means that there is a negative relationship between the money supply variable and unemployment. The third hypothesis, which assumes that the money supply has a direct effect on unemployment, is rejected.

Based on the results of the data analysis in this study, the variable of the amount of money in circulation is not significant to unemployment in Indonesia. The results of this study are different from the research conducted by Burhani (2014), whose results explain that the amount of money in circulation produces a positive value and has an effect on unemployment. When there is an increase in the amount of money in circulation, it will cause the unemployment rate to

increase. However, the findings in this study are the same as those obtained by Susandika (2023), where the variable of the amount of money in circulation does not have a significant effect on unemployment.

It is known that the results of the Sobel test calculation above obtained a t-count of 0.21482, which is smaller than the t-table (N: 32) of 2.051830. So it can be concluded that the mediation coefficient is not significant, which means that inflation is unable to mediate the indirect effect of the exchange rate on unemployment. The hypothesis that inflation mediates the effect of the amount of money in circulation on the unemployment rate is rejected.

The findings obtained using the Sobel Test indicate that the inflation variable cannot mediate the relationship between the amount of money in circulation and unemployment indirectly. The results of the study found differences from the proposed hypothesis. The results of this study also show that the variable of the amount of money in circulation is unable to provide a direct or indirect influence on unemployment.

d. Analysis of the Direct Effect of Inflation Variables on Unemployment

The inflation variable has a profitability value of 0.1829, which is greater than the 5% significance level. This means that the inflation variable does not have a significant effect on unemployment. The regression coefficient value is - 0.123394, which means that there is a negative relationship between the inflation variable and unemployment. So if inflation increases by 1%, on average, the unemployment rate will decrease by 0.123394%.

This research is in line with research conducted by Khairunnisa (2022). In his research, he explained that the inflation variable has a negative and insignificant effect on the unemployment rate. So, in the hypothesis of this study, it is considered that there is a difference with the Phillips Curve theory, which states that there is an inverse relationship (trade-off) between unemployment and inflation. This is the same as the results of research conducted by (Yehosua, Rotinsulu, & Niode, 2019), which shows that inflation has a negative and insignificant effect on the unemployment rate. So, from this study, it can be concluded that partially the inflation variable has a negative effect, meaning that the higher the inflation rate, the lower the unemployment rate. However, in this study, inflation does not have a significant effect. With the results of the study, it can be seen that the Phillips curve theory, which explains the trade-off between inflation and unemployment, does not apply in Indonesia.

IV. CONCLUSION

Interest rates have a dominant influence on inflation and unemployment compared to other monetary variables. This is because interest rates are a policy variable for controlling inflation. When inflation tends to increase, Bank Indonesia can take a policy to raise interest rates so that inflation can be reduced.

The exchange rate has a negative relationship with unemployment directly. The results of this study explain that the exchange rate produces a negative relationship value and has a significant effect on unemployment. The effect of the exchange rate on unemployment has a negative or inverse relationship. An increase in the exchange rate relative to the rupiah will decrease the unemployment rate, but a reduction in the rupiah exchange rate will result in an increase in unemployment. The currency rate may favorably influence inflation; nevertheless, it cannot indirectly impact unemployment via inflation.

The amount of money in circulation does not significantly affect unemployment, either directly or indirectly. This means that there is a neutrality of the amount of money in circulation towards unemployment. Finally, there is a significant negative effect between inflation and unemployment, and this can be interpreted that when inflation increases, it will be followed by a contraction in unemployment. This shows that the results of this study are in line with the Phillips curve theory about the trade-off between inflation and unemployment.

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